

A NEW MIMETIC SPECIES OF *DANAUS* (*TIRUMALA*) FROM THE SOLOMON ISLANDS (LEPIDOPTERA : DANAIDAE)

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SYNOPSIS

A new species of *Danaus* is described and its mimetic association with other species of Danaidae and a species of *Hypolimnas* is discussed.

INTRODUCTION

While engaged on the determination of the material from Rennell and Bellona Islands (Howarth, 1962), the senior author was pleased to receive the collections made about 1954 by Dr. F. R. Hollins in the Solomon Islands. Amongst this material was an interesting specimen of the genus *Danaus* which obviously belonged to a new taxon. It was captured on Santa Ana, an off-shore island to the S. E. of San Cristobal, in September 1954. It is a male and in general appearance closely resembles several species of *Euploea* found in that area. It was put aside to await the capture of a female so that both sexes could be described at the same time but unfortunately no female has become available for study so far. Subsequently the junior authors sent photographs to London of two other male specimens but this time from San Cristobal for determination and comment.

At first we thought the specimens were an undescribed subspecies of *Danaus* (*Tirumala*) *hamata* McLeay inhabiting San Cristobal rather than both Santa Ana and San Cristobal but since that time the B. M. (N. H.) has received another two male examples from Santa Ana and we have also confirmed undoubted specimens of *hamata* McLeay captured on San Cristobal. It seems, therefore, that this remarkable insect should be considered a genuine species and is now described below as

Danaus (*Tirumala*) *euploeomorpha* sp. n.

MALE. Head, deep blackish brown with paired white spots on occiput, apex and surrounds of eyes. Antennae, black with extreme tip of club reddish. Palpi, basal segment white, middle segment black with white laterally, terminal segment black. Thorax, blackish brown with thin white dorsal line; two small white dorsal spots centrally towards collar; patagia blackish brown with irregular white fringes and with a white spot adjacent to base of costa of forewing; prominently marked laterally and ventrally with white spots typical of the genus. Legs, prothoracic pair, black with white markings adjacent to joint of femur and tibia, tarsus black, striped inwardly and outwardly with white, terminal segments black; meso and metathoracic pairs, black with white stripe on ventral surface of femur.

Upperside. Fore wing, length between 40-44 mm. Ground colour blackish brown basally, slightly paler along costa with a large creamy white apical and marginal area extending from tornus to space 9 and with a vestige of it in space 10. This broad white area clearly defined subapically and divided sharply by the brownish black veins but more diffuse and tapering towards tornus. An inwardly distinct elongate creamy white submarginal spot in space 1 and another slightly smaller spot sometimes present in upper half of space 3. A submarginal series of faint creamy white oval spots sometimes present, that at base of space 7 most prominent. Margin, and apex clouded with pale brown inwardly along veins. Fringes deep brown. Hind wing, ground colour as fore wing but

slightly paler merging distally into the creamy submarginal area but extending interneurally to and towards margin. There is a faint indication of a double row of paired pale submarginal spots typical of *Tirumala*. Veins, margin and fringe blackish brown with the latter sometimes paler either side of the interneural folds. A prominent creamy white inverted V marking at base of space 2 with lower arm extending some 4.5–6 mm along vein 2 to the greyish brown area of the pouch. A pale triangular streak tapering distally at base of space 1a and a short streak in space 1, and creamy white streaks both basally and terminally in space 8.

Underside. Fore wing. As upperside but slightly paler marginally as it lacks the brownish clouding at the termination of the veins. Hind wing. As upperside but slightly paler marginally, with the double series of white submarginal and marginal spots often more distinct and sometimes confluent forming ill-defined streaks. A prominent white elongate spot placed centrally basad in space 7 with a dark brown streak distally. The ground colour of the basal areas of the lower interspaces 2–6 also darkened centrally. The base of the median vein with a prominent white spot either side of the wing root.

FEMALE. Unknown.

Holotype male. SOLOMON ISLANDS, Santa Ana Is. Eastern District. 26. ix. 1954. F.R. Hollins. B.M. 1960-120. Gen. Prep. T.G.H. 1962-565. Type No. Rh. 18620. Paratypes. 2♂ SOLOMON ISLANDS, Santa Ana Is. Beachside near Gupuna. B.M. 1975-516, Type No. Rh. 18621 and 18622; 1♂ SOLOMON Is. San Cristobal, Kirakira, 12. v. 1966. (coll. K. Sakaguchi, Nishinomiya, Hyôgo-ken, Japan); 1♂ S.E. SOLOMON Is. San Cristobal. S.E. Coastal strip, 4. xii. 1969. R. Straatman. (coll. A. Sibatani).

GENITALIA.

Examination of the genitalia indicates that this newly described species is closely related to *D. (T.) hamata hamata* McLeay. It has the same form of valva and a rather similar aedoeagus with a considerable armature of cornuti on the vesica.

MIMETIC ASSOCIATIONS.

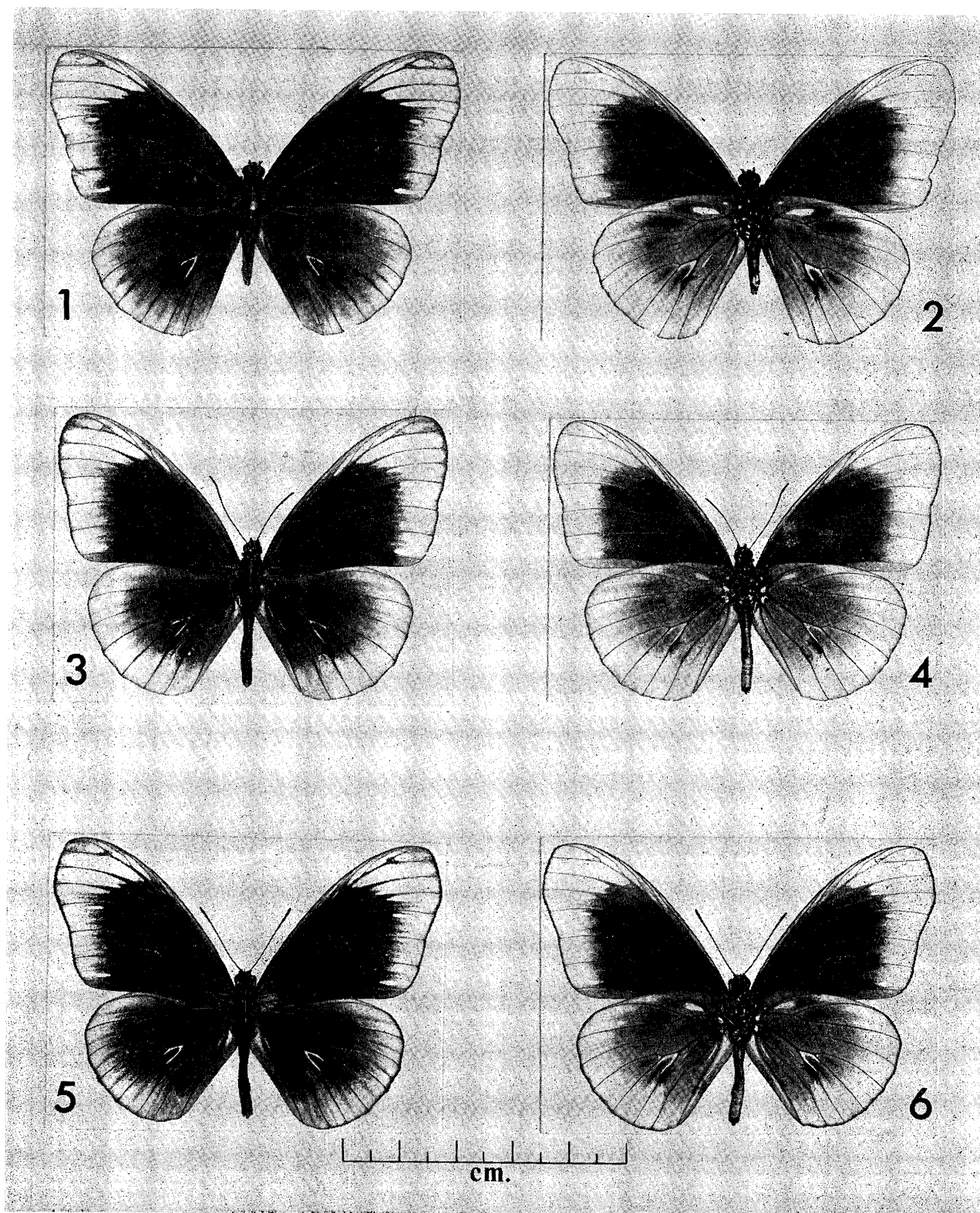
Four other species of Danaidae and a species of *Hypolimnias* (Nymphalidae) which resemble *D. euploeomorpha* superficially fly on Santa Ana and San Cristobal. They are approximately the same size and all have a deep brown ground colour with broad creamy white margins on both upper and under surfaces of all wings. It seems almost certain that the five species of Danaidae form a Müllerian ring while the female of the *Hypolimnias* is a Batesian mimic. The species concerned in this association are *Danaus philene insolata* Butler, *Euploea leucostictos* (Gmelin) [= *nemertes* (Hübner)] *imitata* Butler, *Euploea boisduvali brechleyi* Butler, *Euploea nechos* Mathew and *Hypolimnias alimena fuliginescens* Mathew ♀. As these taxa also occur on the island of Ugi to the north of San Cristobal it will be of interest to see if *euploeomorpha* is recorded eventually from that island.

REFERENCES

- HOWARTH, T.G. (1962) The Rhopalocera of Rennell and Bellona Islands. Nat. Hist. Rennell Is. Brit. Sol. Is. 4 (37), 63–83.

ACKNOWLEDGEMENTS

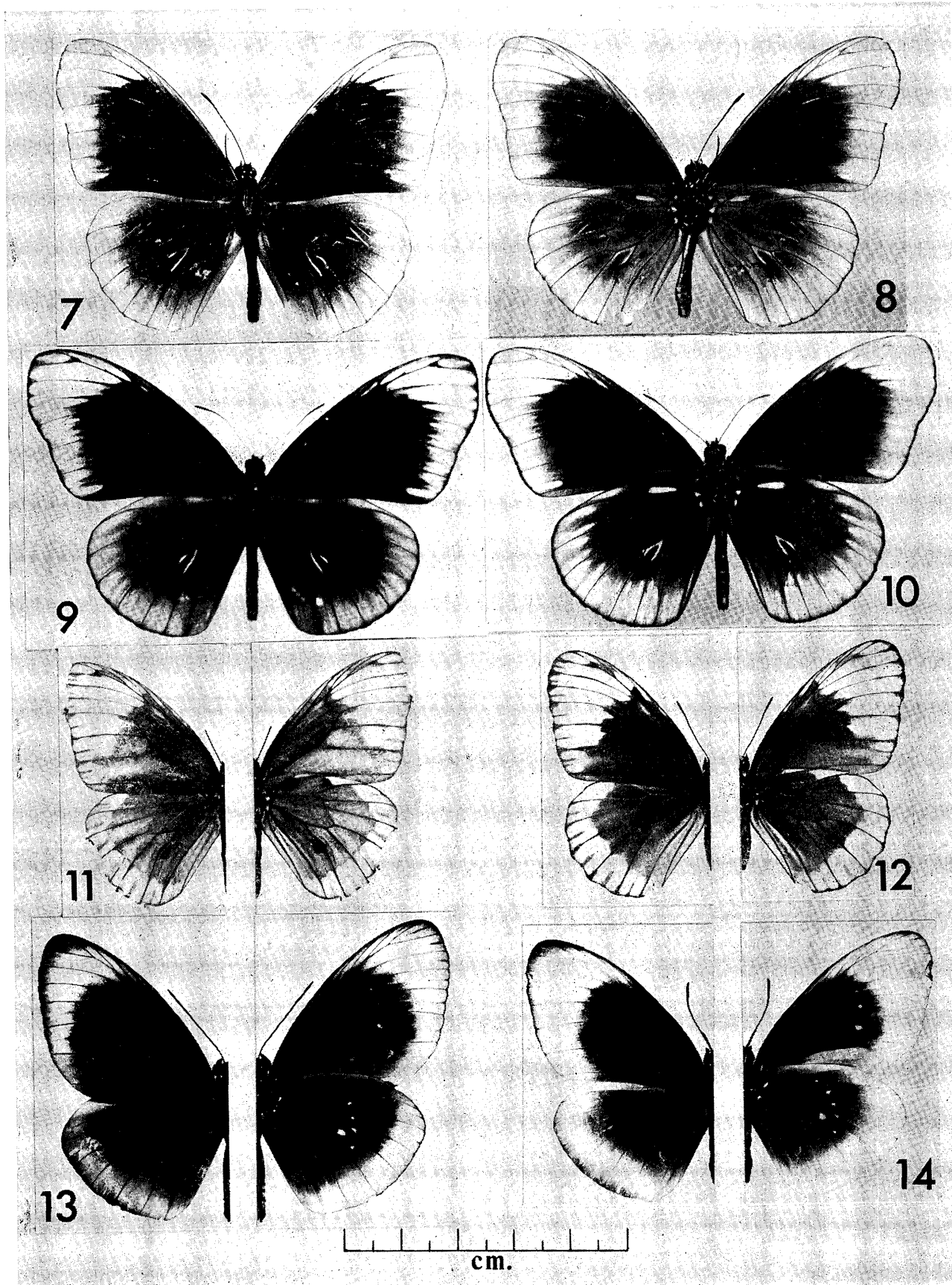
The senior author wishes to express his especial thanks to his colleagues, Mr. R.I. Vane-Wright for his helpful suggestions concerning the manuscript, to Mr. R. Smiles for mounting the photographs and to Mr. P. York for taking these of the B.M. (N.H.) material. The last author expresses his gratitude to Mr. R. Straatman for his generous gift of the paratype of *D. (T.) euploeomorpha* from San Cristobal and a few other interesting Danaid specimens from the same locality for comparison.



Danaus (Tirumala) euploeomorpha sp. n.

Figs. 1-2 Holotype ♂ - Santa Ana Is. 26. ix. 1954 (B.M. [N.H.].)

Figs. 3-6 Paratype ♂♂ - Santa Ana Is. Beachside near Gupuna (B.M. [N.H.].)



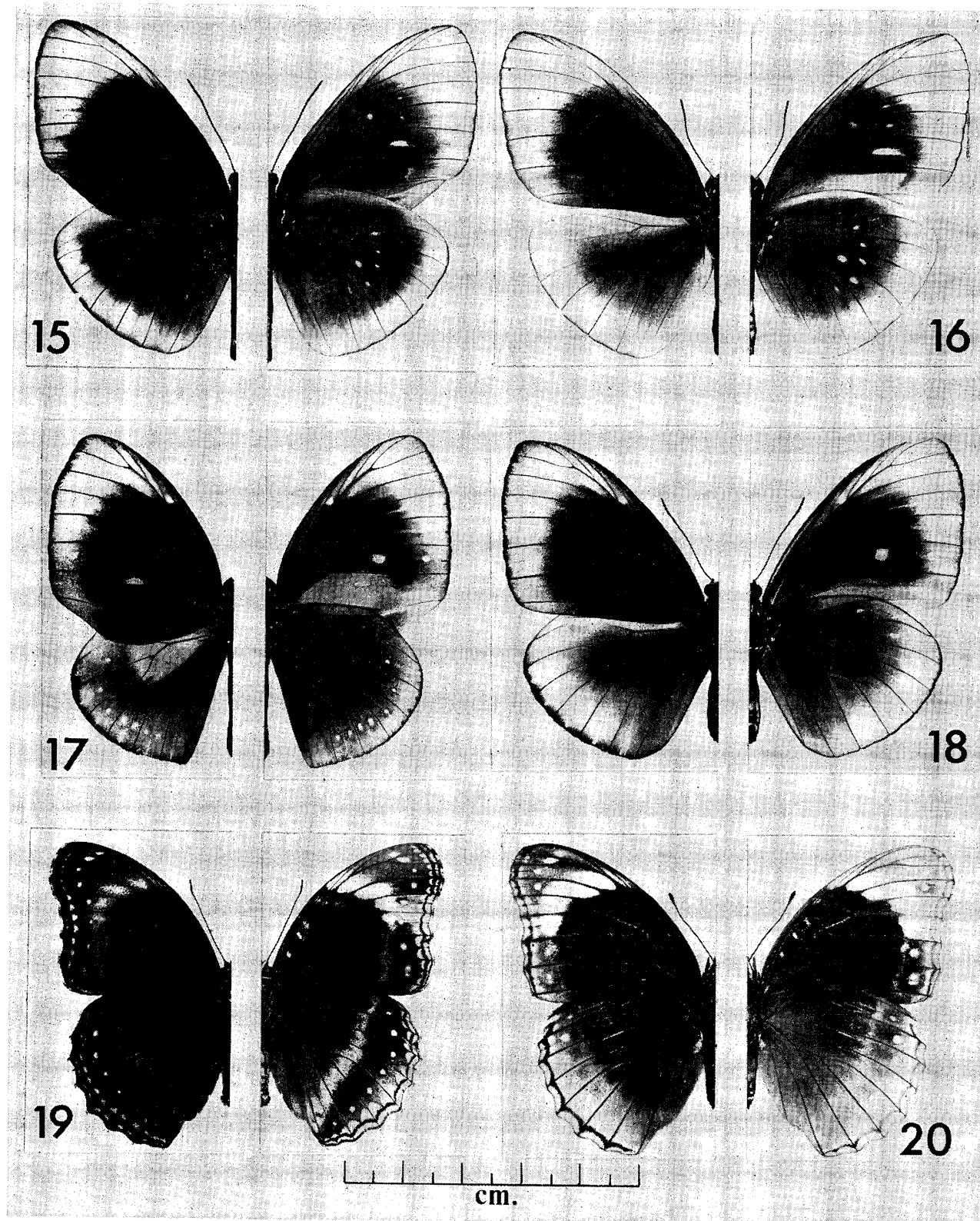
Danaus (Tirumala) euploeomorpha sp. n. and other species.

Figs. 7-8 Paratype ♂ - San Cristobal, Kirakira 12.v.1966 (K. Sakaguchi coll.).

Figs. 9-10 Paratype ♂ - San Cristobal, S.E. Coastal strip 4.xii.1969 (A. Sibatani coll.).

Figs. 11-12 ♂, ♀ *Danaus philene insolata* Butler - Santa Ana Is.

Figs. 13-14 ♂, ♀ *Euploea boisduvali brenchleyi* Butler - Santa Ana Is.

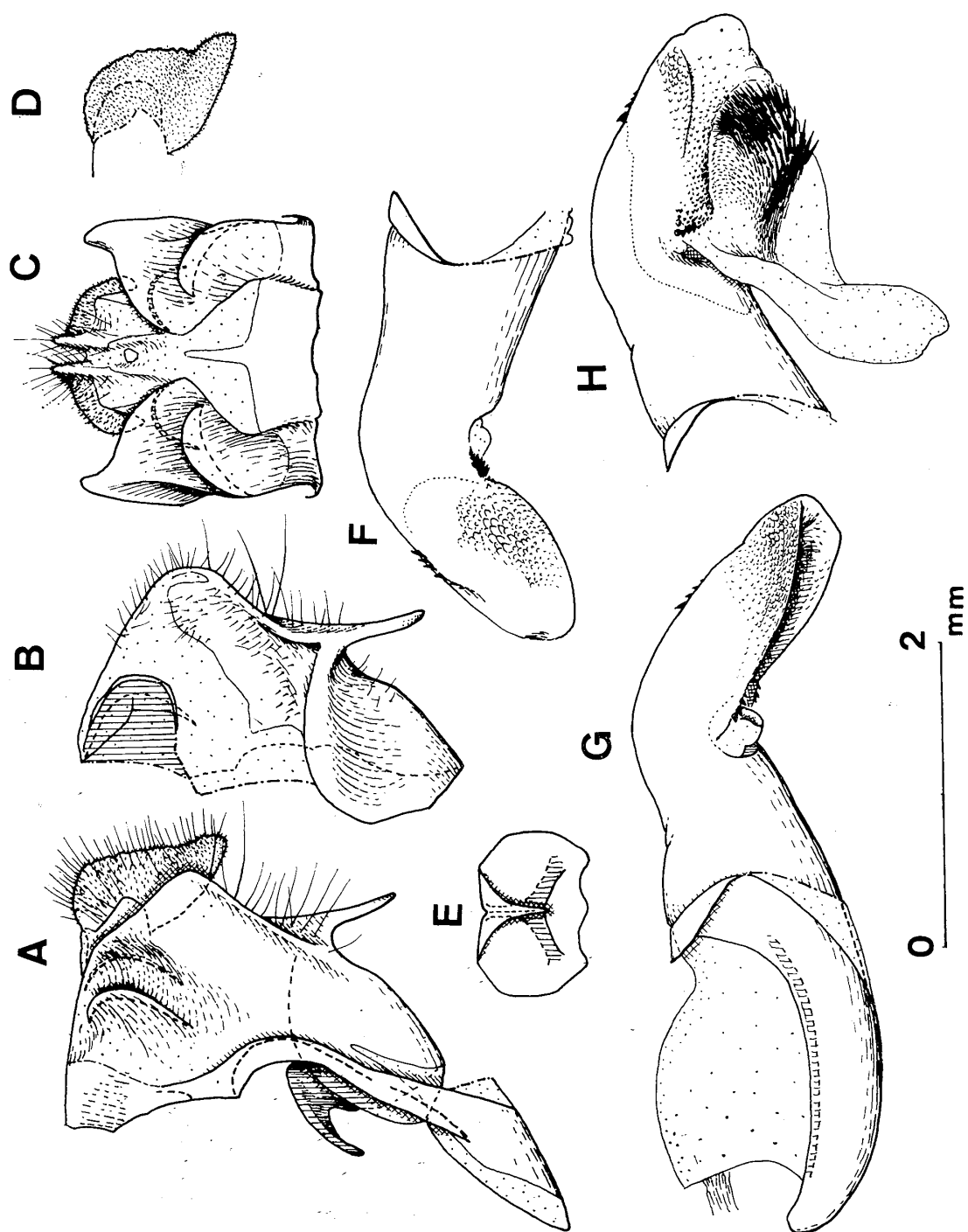


Model and mimetic species from Santa Ana Is.

Figs. 15-16 ♂, ♀ *Euploea nechos* Mathew, f. *prusias* Godman & Salvin.

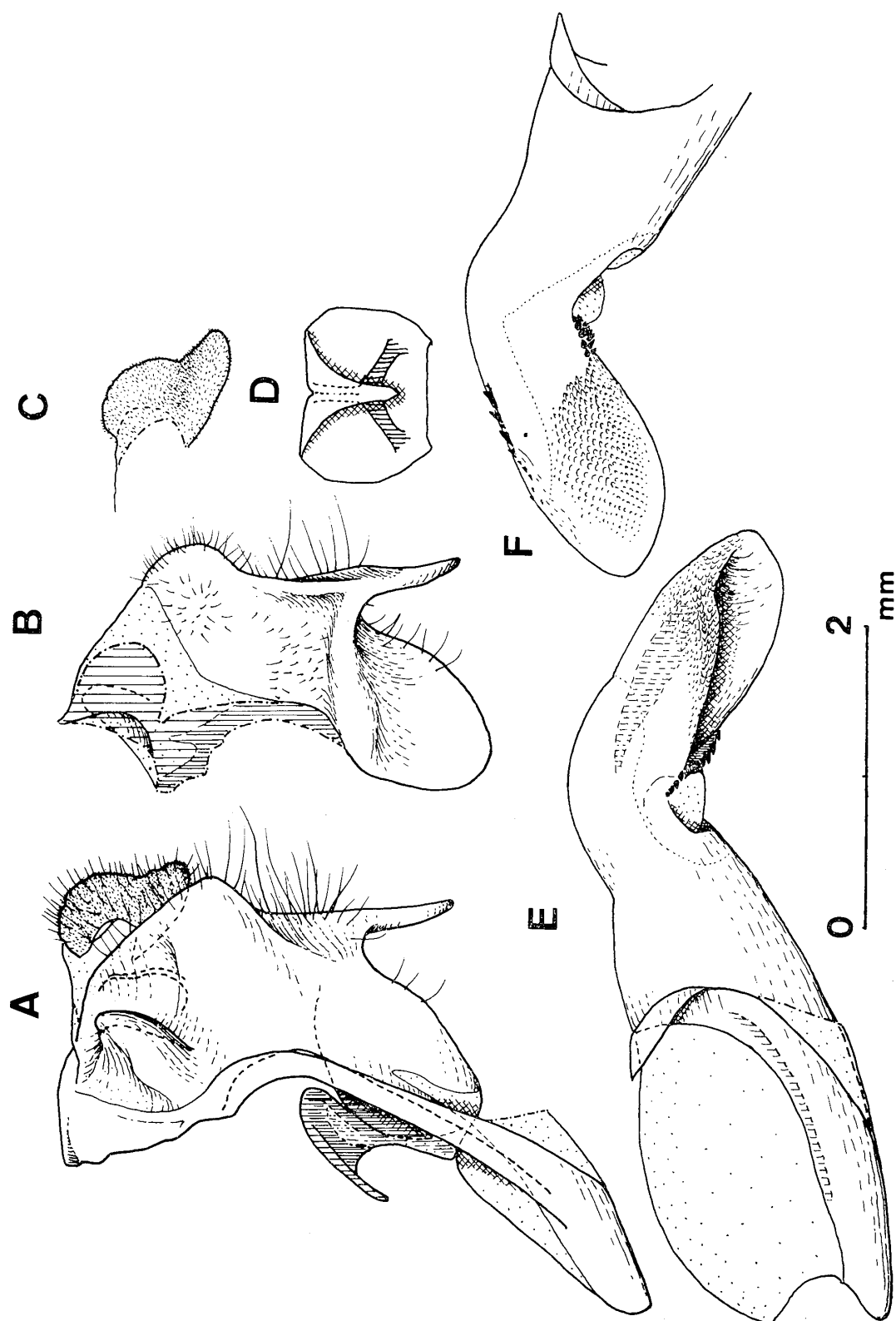
Figs. 17-18 ♂, ♀ *Euploea leucostictos* (Gmelin) [= *nemertes* (Hübner)] *imitata* Butler.

Figs. 19-20 ♂, ♀ *Hypolimnas alimena fuliginescens* Mathew.



Danaus (Tirumala) euploeomorpha sp. n.

Fig. 21 Male genitalia. A. Left side as a whole, phallus removed. B. Inner aspect of valva. C. Dorsal aspect of ring. D. Socius. E. Juxta. F. Phallus, left side. G. Phallus, right side. H. Vesica everted showing cornuti.



Danaus (Tirumala) hamata McLeay from San Cristobal Is.

Fig. 22 Male genitalia. A. Left side as a whole, phallus removed. B. Inner aspect of valva. C. Socius. D. Juxta. E. Phallus, left side. F. Phallus, right side.